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10/808,938

03/25/2004

Anthony Richard Huggett

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12/05/2006

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EXAMINER

CHAUDRY, MUJTABA M

ART UNIT

PAPER NUMBER

2133

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                          |  |
|------------------------------|------------------------|--------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b>      |  |
|                              | 10/808,938             | HUGGETT, ANTHONY RICHARD |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>          |  |
|                              | Mujtaba K. Chaudry     | 2133                     |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 1-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/25/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Claims 1-14 are presented for examination.

#### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file. The priority date granted is March 27, 2003.

#### ***Information Disclosure Statement***

The references listed in the information disclosure statements (IDS) submitted March 25, 2004 were considered. The submission is in compliance with the provisions of 37 CFR 1.97. Form PTO-1449 is signed and attached.

#### ***Oath/Declaration***

The Oath filed March 25, 2004 is objected to because:

- It is noted in the section for the claim of foreign priority Applicant has checked box indicating certified copy is **not** attached when infact the certified copy is in the file.

Appropriate correction/explanation is requested. See MPEP 602.

#### ***Drawings***

The drawings submitted March 25, 2004 are accepted.

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### *Specification*

Applicant is reminded of the proper language and format for an abstract of the disclosure. See MPEP 608.01(b).

***The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.***

***The language should be clear and concise and should not repeat information given in the title or claim(s). It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.***

The abstract is objected to because:

- The abstract of the disclosure is objected to because it exceeds 150 words.
- The term "visualized" is misspelled.

Correction is requested.

The Specification is objected to because:

- On page 1, line 21 there should be a space between the words "encoded" and "signal" towards the end of the line.
- It is noted that the specification seems to use the terms "original signal," "original encoded signal" and "encoded signal" interchangeably. Examiner presumes, for the purposes of examination, all three to be the same. Applicant is strongly suggested to use uniform language throughout the specification in order to avoid unnecessary

confusion. For example, lines 5 and 17 on page 2. Correction is needed throughout the entire disclosure.

- Applicant is strongly urged to use the terms “a” and “the” throughout the specification when referring to something the first time and when referring back to something that is already mentioned, respectively. For examples, see objections made to claims that are also cited in the specification. Correction is needed throughout the entire disclosure.
- The term “synchronization” is misspelled throughout the specification.
- The term “visualized” is misspelled throughout the specification.
- The term “serialized” is misspelled throughout the specification.
- The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Appropriate correction is requested.

### ***Claim Objections***

Applicant's cooperation is requested to review all claims thoroughly and make similar corrections as needed. The objections pointed out do not inhibit the Examiner from interpreting the claims for the purposes of examination with regards to the prior art.

Claim 1 is objected to because of the following informalities:

- In line 5, there needs to be “a” prior to “first Viterbi decoder” and an “a” prior to “delay”.
- In step c, there needs to be “a” prior to “first de-interleaver”.
- In step e, there needs to be “the” prior to “first interleaver”.
- In step e, there needs to be “a” prior to “second Viterbi decoder means”.
- In step g, there needs to be “a” prior to “second de-interleaver means”.
- In step h, there needs to be “a” prior to “second block decoder means”.

Appropriate correction is requested. Applicant is requested to recheck and make additional grammatical corrections as needed. As pointed out, the limitation needs to be preceded by “a” when it appears the first time and each succeeding time it needs to be referred to by the terms “the” or “said” to show proper antecedent.

Claim 5 is objected to because of the following informalities:

- In line 1, the phrase, “the original signal” needs to be replaced with “the received encoded signal” or the like. Applicant is strongly urged to use uniform language throughout the claims and specification to avoid unnecessary confusion.

Appropriate correction is requested. Applicant is requested to recheck and make additional corrections as needed.

Claim 7 is objected to because of the following informalities:

- The term “synchronization” is misspelled.

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Appropriate correction is requested. Applicant is requested to recheck and make additional corrections as needed.

Claim 8 is objected to because of the following informalities:

- Each step of the claim needs to begin with an “a”, “an” or “the” when appropriate.
- Applicant is requested to make similar corrections to claim 8 as pointed out in claim 1 regarding the usage of “a” and “the” or “said” when necessary to show proper antecedent. For example, line 14 “first interleaver” should be “said first interleaver” or “the first interleaver” to show proper antecedent.
- In line 20 and other lines in the claim, the phrase, “the original signal” needs to be replaced with “the received encoded signal” or the like. Applicant is strongly urged to use uniform language throughout the claims and specification to avoid unnecessary confusion.

Appropriate correction is requested. Applicant is requested to recheck and make additional corrections as needed.

Claim 9 is objected to because of the following informalities:

- Applicant is requested to make similar corrections to claim 9 as pointed out in claims 1 and 8 regarding the usage of “a” and “the” or “said” when necessary to show proper antecedent. For example, line 1 “second delay means” should be “said second delay means”.

Appropriate correction is requested. Applicant is requested to recheck and make additional corrections as needed.

Claim 11 is objected to because of the following informalities:

- In line 1, the phrase “in any of claim 8” needs to be replaced with “in claim 8”.

Appropriate correction is requested. Applicant is requested to recheck and make additional corrections as needed.

Claim 12 is objected to because of the following informalities:

- In line 1, the phrase “in any of claim 8” needs to be replaced with “in claim 8”.
- In line 19 and other lines in the claim, the phrase, “the original signal” needs to be replaced with “the received encoded signal” or the like. Applicant is strongly urged to use uniform language throughout the claims and specification to avoid unnecessary confusion.

Appropriate correction is requested. Applicant is requested to recheck and make additional corrections as needed.

Claim 14 is objected to because of the following informalities:

- The term “synchronization” in line 2 is misspelled.

Appropriate correction is requested. Applicant is requested to recheck and make additional corrections as needed.



***Allowable Subject Matter***

Claims 1-14 would be in condition for allowance once the minor informalities noted in the "Claim Objections" are corrected and reviewed by the Examiner. The following is a statement of reasons for the indication of allowable subject matter:

Independent claim 1 of the present application teaches a method of decoding a concatenated convolutional encoded and block encoded signal, the method comprising the steps of: a) applying the encoded signal to first Viterbi decoder means and delay means to form a delayed encoded signal; b) decoding the encoded signal with the first Viterbi decoder means to form a first Viterbi decoded signal; c) de-interleaving the first Viterbi decoded signal with first de-interleaver means to form a first de-interleaved signal; d) block decoding the first de-interleaved signal, with first block decoder means, identifying correctly decoded blocks and marking decoded bits identified as belonging to the correctly decoded blocks to form a marked decoded signal; e) interleaving the marked decoded signal using first interleaver means for output to second Viterbi decoder means; f) decoding the delayed encoded signal with the second Viterbi decoder means using the interleaved marked decoded signal by: for each received encoded symbol representative of a bit in an original signal encoded with a convolutional encoder and block encoder to form the concatenated convolutional encoded and block encoded signal, adding, for each possible current state of the convolutional encoder, error coefficients representative of differences between the received encoded symbol, representative of a transition from a previous state to a current state, and expected symbols corresponding to predetermined permitted transitions from previous states to the current state, to a sum of such error coefficients for said previous states to form updated sums of such error coefficients for each of a new

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plurality of state sequences for all possible states; determining whether the bit is a marked decoded bit and if the bit is a marked decoded bit, for every state, selecting both a most probable state sequence ending in that state from the new plurality of state sequences and a corresponding updated sum of error coefficients according to said predetermined bit, thereby discounting, at a bit location in the encoded signal corresponding to the marked decoded bit, any state inconsistent with the marked decoded bit; if the bit is not a marked decoded bit, for every state, comparing said updated sums of error coefficients and selecting an updated sum of error coefficients representing a lesser total of said differences between the received encoded symbols and the expected symbols and selecting a corresponding most probable state sequence ending in that state from the new plurality of state sequences; determining a best current state for the bit in the original signal by one of comparing the updated sums of error coefficients of the most probable state sequences for every state and choosing a state arbitrarily; and thereby determining, by tracing back from the best current state, a most probable earliest transition and earliest state that occurred a predetermined plurality of symbols previously, and outputting a bit most probably equal to the bit in the original signal to form a second Viterbi decoded signal; g) de-interleaving the second Viterbi decoded signal with second de-interleaver means to form a second de-interleaved signal; and h) block decoding the second de-interleaved signal with second block decoder means to form a decoded output signal. The prior arts of record do not teach nor fairly suggest the foregoing limitations. Particularly, the prior arts of record, taken alone or in combination, do not teach or fairly suggest interleaving the marked decoded signal using first interleaver means for output to second Viterbi decoder means; f) decoding the delayed encoded signal with the second Viterbi decoder means using the interleaved marked decoded signal by:

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for each received encoded symbol representative of a bit in an original signal encoded with a convolutional encoder and block encoder to form the concatenated convolutional encoded and block encoded signal, adding, for each possible current state of the convolutional encoder, error coefficients representative of differences between the received encoded symbol, representative of a transition from a previous state to a current state, and expected symbols corresponding to predetermined permitted transitions from previous states to the current state, to a sum of such error coefficients for said previous states to form updated sums of such error coefficients for each of a new plurality of state sequences for all possible states; determining whether the bit is a marked decoded bit and if the bit is a marked decoded bit, for every state, selecting both a most probable state sequence ending in that state from the new plurality of state sequences and a corresponding updated sum of error coefficients according to said predetermined bit, thereby discounting, at a bit location in the encoded signal corresponding to the marked decoded bit, any state inconsistent with the marked decoded bit; if the bit is not a marked decoded bit, for every state, comparing said updated sums of error coefficients and selecting an updated sum of error coefficients representing a lesser total of said differences between the received encoded symbols and the expected symbols and selecting a corresponding most probable state sequence ending in that state from the new plurality of state sequences; determining a best current state for the bit in the original signal by one of comparing the updated sums of error coefficients of the most probable state sequences for every state and choosing a state arbitrarily; and thereby determining, by tracing back from the best current state, a most probable earliest transition and earliest state that occurred a predetermined plurality of symbols previously, and outputting a bit most probably equal to the bit in the original signal to form a second Viterbi decoded signal; g)

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de-interleaving the second Viterbi decoded signal with second de-interleaver means to form a second de-interleaved signal; and h) block decoding the second de-interleaved signal with second block decoder means to form a decoded output signal. These limitations are not obvious over the prior arts of record and are believed to be novel.

Independent claim 8 recites similar limitations as those found in claim 1 and therefore is allowable as well.

Dependent claims 2-7 and 9-14 depend from independent claims 1 and 8 respectively and inherently include the limitations therein and therefore are allowable as well.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Additional pertinent prior arts are included herein for Applicant's review.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mujtaba K. Chaudry whose telephone number is 571-272-3817. The examiner can normally be reached on Mon-Thur 9-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on 571-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Mujtaba Chaudry  
Art Unit 2133  
November 29, 2006